

**Science TEKS Transition
Analysis Resources**

October 2009

The State Board of Education (SBOE) adopted new K-12 science Texas Essential Knowledge and Skills (TEKS) in March 2009. The implementation date for these new science TEKS is the 2010-11 school year. These new curriculum standards are rigorous and include more specificity than previous standards. The new curriculum standards in grades 6-12 are also closely aligned with the College and Career Readiness Standards (CCRS).

As with all revised curriculum standards, teachers and other educators need time to prepare and to understand the changes in the standards. This document was prepared to show a number of important aspects to the new K-12 science TEKS, including the following:

1. New or expanded content in the 2010 science TEKS for a specific grade level or course
2. The outgoing movement of a science content from one grade level to another
3. The incoming movement of a science content from one grade level to another
4. Science content from the 1998 TEKS that are not included in the 2010 TEKS for a specific grade level or course

The Texas Education Agency (TEA) will provide professional development opportunities on the new science TEKS in spring/summer 2010.

We hope that these TEKS transition analysis resources will help educators prepare for the implementation of the new science TEKS in 2010-2011.

Elementary School TEKS Transition Analysis – Grades K-5
Middle School TEKS Transition Analysis – Grades 6-8
High School TEKS Transition Analysis – Biology, Chemistry, Physics, IPC

Science TEKS – Middle School TEKS Transition Analysis

Grade 6

Please note that the Knowledge and Skills (KS) statements have been omitted from this list. It will be important for teachers to understand each Student Expectation in context of the KS statement.

New or Expanded Content for Grade 6 Found in New 2010 Science TEKS

The cohort of 6th grade students in 2009-2010 will not have IPC available to them on the Recommended graduation plan. This cohort will be taking biology, chemistry, and physics. These Student Expectations represent new content found in the newly adopted TEKS that this cohort of students will be missing.

- 6.2C** collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;
- 6.2E** analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.
- 6.3A** in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
- 6.4A** use appropriate tools to collect, record, and analyze information, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, triple beam balances, microscopes, thermometers, calculators, computers, timing devices, and other equipment as needed to teach the curriculum; and
- 6.4B** use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.
- 6.5A** know that an element is a pure substance represented by chemical symbols;
- 6.5B** recognize that a limited number of the many known elements comprise the largest portion of solid Earth, living matter, oceans, and the atmosphere;
- 6.5C** differentiate between elements and compounds on the most basic level; and
- 6.5D** identify the formation of a new substance by using the evidence of a possible chemical change such as production of a gas, change in temperature, production of a precipitate, or color change.
- 6.6B** calculate density to identify an unknown substance; and
- 6.7A** research and debate the advantages and disadvantages of using coal, oil, natural gas, nuclear power, biomass, wind, hydropower, geothermal, and solar resources; and
- 6.7B** design a logical plan to manage energy resources in the home, school, or community.
- 6.8A** compare and contrast potential and kinetic energy;
- 6.8C** calculate average speed using distance and time measurements;
- 6.9A** investigate methods of thermal energy transfer, including conduction, convection, and radiation;

- 6.9B** verify through investigations that thermal energy moves in a predictable pattern from warmer to cooler until all the substances attain the same temperature such as an ice cube melting; and
- 6.10A** build a model to illustrate the structural layers of Earth, including the inner core, outer core, mantle, crust, asthenosphere, and lithosphere;
- 6.10C** identify the major tectonic plates, including Eurasian, African, Indo-Australian, Pacific, North American, and South American; and
- 6.10D** describe how plate tectonics causes major geological events such as ocean basins, earthquakes, volcanic eruptions, and mountain building.
- 6.11B** understand that gravity is the force that governs the motion of our solar system; and
- 6.12B** recognize that the presence of a nucleus determines whether a cell is prokaryotic or eukaryotic;
- 6.12C** recognize that the broadest taxonomic classification of living organisms is divided into currently recognized Domains;
- 6.12D** identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms;
- 6.12E** describe biotic and abiotic parts of an ecosystem in which organisms interact; and
- 6.12F** diagram the levels of organization within an ecosystem, including organism, population, community, and ecosystem.

1998 Science Grade 6 Content REVISED AND MOVED to a Different Grade Level

| 1998 TEKS | Content Being Moved to 2010 TEKS |
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| 6.8B explain and illustrate the interactions between matter and energy in the water cycle and in the decay of biomass such as in a compost bin; and | 7.5B demonstrate and explain the cycling of matter within living systems such as in the decay of biomass in a compost bin; and |
| 6.8C describe energy flow in living systems including food chains and food webs. | 7.5C diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids. |
| 6.10A differentiate between structure and function; | 7.12D differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole; |
| 6.10B determine that all organisms are composed of cells that carry on functions to sustain life; and | 7.12F recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life. |
| 6.11A identify some changes in traits that can occur over several generations through natural occurrence and selective breeding; | 7.11C identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (<i>Geospiza fortis</i>) or domestic animals. |
| 6.11B identify cells as structures containing genetic material; and 6.11C interpret the role of genes in inheritance. | 7.14A define heredity as the passage of genetic instructions from one generation to the next generation; |
| 6.12A identify responses in organisms to internal stimuli such as hunger or thirst; | 7.13B describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance. |
| 6.12B identify responses in organisms to external stimuli such as the presence or absence of heat or light; and | 7.13A investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and |
| 6.14B identify relationships between groundwater and surface water in a watershed; and | 7.8C model the effects of human activity on groundwater and surface water in a watershed. |

* 1998 Content Moved **INTO** 2010 TEKS – Grade 6

| 1998 TEKS | Content Being Moved to 2010 TEKS |
|---|---|
| 7.7C recognize that compounds are composed of elements. | 6.5C differentiate between elements and compounds on the most basic level; and |
| 7.7B describe physical properties of elements and identify how they are used to position an element on the periodic table; and | 6.6A compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability; 8.5C interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements; |
| 7.8A illustrate examples of potential and kinetic energy in everyday life such as objects at rest, movement of geologic faults, and falling water; and | 6.8A compare and contrast potential and kinetic energy; |
| 7.6A demonstrate basic relationships between force and motion using simple machines including pulleys and levers; | 6.8E investigate how inclined planes and pulleys can be used to change the amount of force to move an object. |
| 8.12A analyze and predict the sequence of events in the lunar and rock cycles; | 6.10B classify rocks as metamorphic, igneous, or sedimentary by the processes of their formation; |

* **NOTE:** The 2009-2010 cohort of 6th grade students will miss this content.

1998 Science TEKS Content **NOT INCLUDED** in the 2010 Science TEKS – Grade 6

- 6.4B** identify patterns in collected information using percent, average, range, and frequency.
 - 6.5A** identify and describe a system that results from the combination of two or more systems such as in the solar system; and
 - 6.5B** describe how the properties of a system are different from the properties of its parts.
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Science TEKS – Middle School TEKS Transition Analysis

Grade 7

Please note that the Knowledge and Skills (KS) statements have been omitted from this list. It will be important for teachers to understand each Student Expectation in context of the KS statement.

New or Expanded Content for Grade 7 Found in New 2010 Science TEKS

- 7.2A** plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;
- 7.2B** design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
- 7.2C** collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;
- 7.2E** analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.
- 7.3A** in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
- 7.3B** use models to represent aspects of the natural world such as human body systems and plant and animal cells;
- 7.3C** identify advantages and limitations of models such as size, scale, properties, and materials; and
- 7.4A** use appropriate tools to collect, record, and analyze information, including life science models, hand lens, stereoscopes, microscopes, beakers, Petri dishes, microscope slides, graduated cylinders, test tubes, meter sticks, metric rulers, metric tape measures, timing devices, hot plates, balances, thermometers, calculators, water test kits, computers, temperature and pH probes, collecting nets, insect traps, globes, digital cameras, journals/notebooks, and other equipment as needed to teach the curriculum; and
- 7.4B** use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.
- 7.5B** demonstrate and explain the cycling of matter within living systems such as in the decay of biomass in a compost bin; and
- 7.5C** diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids
- 7.6A** identify that organic compounds contain carbon and other elements such as hydrogen, oxygen, phosphorus, nitrogen, or sulfur;
- 7.6B** distinguish between physical and chemical changes in matter in the digestive system; and
- 7.6C** recognize how large molecules are broken down into smaller molecules such as carbohydrates can be broken down into sugars.
- 7.7A** contrast situations where work is done with different amounts of force to situations where no work is done such as moving a box with a ramp and without a ramp, or standing still;

- 7.7B** illustrate the transformation of energy within an organism such as the transfer from chemical energy to heat and thermal energy in digestion; and
- 7.7C** demonstrate and illustrate forces that affect motion in everyday life such as emergence of seedlings, turgor pressure, and geotropism.
- 7.8C** model the effects of human activity on groundwater and surface water in a watershed.
- 7.9A** analyze the characteristics of objects in our solar system that allow life to exist such as the proximity of the Sun, presence of water, and composition of the atmosphere; and
- 7.9B** identify the accommodations, considering the characteristics of our solar system, that enabled manned space exploration.
- 7.10B** describe how biodiversity contributes to the sustainability of an ecosystem; and
- 7.11A** examine organisms or their structures such as insects or leaves and use dichotomous keys for identification;
- 7.11C** identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals.
- 7.12A** investigate and explain how internal structures of organisms have adaptations that allow specific functions such as gills in fish, hollow bones in birds, or xylem in plants;
- 7.12B** identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems;
- 7.12C** recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;
- 7.12D** differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;
- 7.12E** compare the functions of a cell to the functions of organisms such as waste removal; and
- 7.12F** recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life.
- 7.14A** define heredity as the passage of genetic instructions from one generation to the next generation;

1998 Grade 7 Content REVISED AND MOVED to a Different Grade Level in 2010 TEKS

| 1998 TEKS | Content Being Moved to 2010 TEKS |
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| 7.6A demonstrate basic relationships between force and motion using simple machines including pulleys and levers; | 6.8E investigate how inclined planes and pulleys can be used to change the amount of force to move an object. |
| 7.6B demonstrate that an object will remain at rest or move at a constant speed and in a straight line if it is not being subjected to an unbalanced force; and | 8.6C investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches. |
| 7.7A identify and demonstrate everyday examples of chemical phenomena such as rusting and tarnishing of metals and burning of wood; | 8.5E investigate how evidence of chemical reactions indicate that new substances with different properties are formed; and |

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| 7.7B describe physical properties of elements and identify how they are used to position an element on the periodic table; and | 8.5C interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements; 6.6A compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability; |
| 7.7C recognize that compounds are composed of elements. | 6.5C differentiate between elements and compounds on the most basic level; and |
| 7.8A illustrate examples of potential and kinetic energy in everyday life such as objects at rest, movement of geologic faults, and falling water; and | 6.8A compare and contrast potential and kinetic energy; |
| 7.12A identify components of an ecosystem; | 6.12E describe biotic and abiotic parts of an ecosystem in which organisms interact; and |
| 7.12B observe and describe how organisms including producers, consumers, and decomposers live together in an environment and use existing resources; | 8.11A describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems; |
| 7.13A identify and illustrate how the tilt of the Earth on its axis as it rotates and revolves around the Sun causes changes in seasons and the length of a day; and | 8.7A model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons; |
| 7.13B relate the Earth's movement and the moon's orbit to the observed cyclical phases of the moon. | 8.7B demonstrate and predict the sequence of events in the lunar cycle; and |

1998 Content Moved **INTO** 2010 TEKS – Grade 7

| 1998 TEKS | Content Being Moved to 2010 TEKS |
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| 6.8B explain and illustrate the interactions between matter and energy in the water cycle and in the decay of biomass such as in a compost bin; and | 7.5B demonstrate and explain the cycling of matter within living systems such as in the decay of biomass in a compost bin; and |
| 6.8C describe energy flow in living systems including food chains and food webs. | 7.5C diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids. |
| 6.14B identify relationships between groundwater and surface water in a watershed; and | 7.8C model the effects of human activity on groundwater and surface water in a watershed. |
| 6.11A identify some changes in traits that can occur over several generations through natural occurrence and selective breeding; | 7.11C identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (<i>Geospiza fortis</i>) or domestic animals. |
| 6.10A differentiate between structure and function; | 7.12D differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole; |
| 6.10B determine that all organisms are composed of cells that carry on functions to sustain life; and | 7.12F recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions such as extracting energy from food to sustain life. |
| 6.12B identify responses in organisms to external stimuli such as the presence or absence of heat or light; and | 7.13A investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and |
| 6.12A identify responses in organisms to internal stimuli such as hunger or thirst; | 7.13B describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance. |
| 6.11B identify cells as structures containing genetic material; and | 7.14A define heredity as the passage of genetic instructions from one generation to the next generation; |
| 6.11C interpret the role of genes in inheritance. | |

1998 Science TEKS Content NOT INCLUDED in the 2010 Science TEKS – Grade 7

- 7.4B** collect and analyze information to recognize patterns such as rates of change.
 - 7.5A** describe how systems may reach an equilibrium such as when a volcano erupts; and
 - 7.5B** observe and describe the role of ecological succession in maintaining an equilibrium in an ecosystem.
 - 7.14C** make inferences and draw conclusions about effects of human activity on Earth's renewable, non-renewable, and inexhaustible resources.
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Science TEKS – Middle School TEKS Transition Analysis

Grade 8

Please note that the Knowledge and Skills (KS) statements have been omitted from this list. It will be important for teachers to understand each Student Expectation in context of the KS statement.

New or Expanded Content for Grade 8 Found in New 2010 Science TEKS

- 8.2A** plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;
- 8.2B** design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
- 8.2C** collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;
- 8.2E** analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.
- 8.3A** in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
- 8.3C** identify advantages and limitations of models such as size, scale, properties, and materials; and
- 8.4A** use appropriate tools to collect, record, and analyze information, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectrometers, timing devices, and other equipment as needed to teach the curriculum; and
- 8.5B** identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity;
- 8.5F** recognize whether a chemical equation containing coefficients is balanced or not and how that relates to the law of conservation of mass.
- 8.6A** demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion;
- 8.6B** differentiate between speed, velocity, and acceleration; and
- 8.6C** investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.
- 8.7C** relate the position of the Moon and Sun to their effect on ocean tides.
- 8.8C** explore how different wavelengths of the electromagnetic spectrum such as light and radio waves are used to gain information about distances and properties of components in the universe;
- 8.9A** describe the historical development of evidence that supports plate tectonic theory;
- 8.9B** relate plate tectonics to the formation of crustal features; and
- 8.9C** interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.

- 8.10B** identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts; and
- 8.11D** recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.

1998 Grade 8 Content REVISED AND MOVED to a Different Grade Level in 2010 TEKS

| 1998 TEKS | Content Being Moved to 2010 TEKS |
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| 8.12A analyze and predict the sequence of events in the lunar and rock cycles; | 6.10B classify rocks as metamorphic, igneous, or sedimentary by the processes of their formation; 8.7B demonstrate and predict the sequence of events in the lunar cycle; and |
| 8.14C describe how human activities have modified soil, water, and air quality. | 7.8C model the effects of human activity on groundwater and surface water in a watershed. |

1998 Content Moved INTO 2010 TEKS – Grade 8

| 1998 TEKS | Content Being Moved to 2010 TEKS |
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| 7.7B describe physical properties of elements and identify how they are used to position an element on the periodic table; and | 8.5C interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements; |
| 6.7A demonstrate that new substances can be made when two or more substances are chemically combined and compare the properties of the new substances to the original substances; and 7.7A identify and demonstrate everyday examples of chemical phenomena such as rusting and tarnishing of metals and burning of wood; | 8.5E investigate how evidence of chemical reactions indicate that new substances with different properties are formed; and |
| 7.6B demonstrate that an object will remain at rest or move at a constant speed and in a straight line if it is not being subjected to an unbalanced force; and | 8.6C investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches. |
| 7.13A identify and illustrate how the tilt of the Earth on its axis as it rotates and revolves around the Sun causes changes in seasons and the length of a day; and | 8.7A model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons; |
| 7.13B relate the Earth's movement and the moon's orbit to the observed cyclical phases of the moon. | 8.7B demonstrate and predict the sequence of events in the lunar cycle; and |
| 7.12B observe and describe how organisms including producers, consumers, and decomposers live together in an environment and use existing resources; | 8.11A describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems; |

1998 Science TEKS Content NOT INCLUDED in the 2010 Science TEKS – Grade 8

- 8.3B** draw inferences based on data related to promotional materials for products and services;
- 8.7B** recognize that waves are generated and can travel through different media.
- 8.9D** identify that physical and chemical properties influence the development and application of everyday materials such as cooking surfaces, insulation, adhesives, and plastics.
- 8.10A** illustrate interactions between matter and energy including specific heat;

- 8.10C** identify and demonstrate that loss or gain of heat energy occurs during exothermic and endothermic chemical reactions.
- 8.11B** distinguish between inherited traits and other characteristics that result from interactions with the environment; and
- 8.11C** make predictions about possible outcomes of various genetic combinations of inherited characteristics
- 8.12B** relate the role of oceans to climatic changes; and
- 8.12C** predict the results of modifying the Earth's nitrogen, water, and carbon cycles.
- 8.14B** analyze how natural or human events may have contributed to the extinction of some species; and
- 8.14C** describe how human activities have modified soil, [water,] and air quality.